

TRAINING NOTES



BATS The Bradley Advanced Training System

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The Bradley advanced training system (BATS), when fully developed, will help address the full spectrum of doctrine, organization, training, leader development, maintenance, and soldiers as an infantry fighting machine. In training, BATS will serve as a precision gunnery trainer, provide combined arms tactical training, and assist in refining command and control and tactics, techniques, and procedures. It will also provide test planning and rehearsal, and record real-time test results.

Presently, the system features a digitized replica of the terrain at the National Training Center in California. Through manipulation of compact discs, however, BATS will be capable of projecting any terrain the U.S. Army Mapping Agency has digitized. It will eventually be possible for soldiers preparing to deploy to a location anywhere in the world to call up the digitized terrain of that site and "fight" on it again and again.

With its simulation common operating environment (SCOE), BATS can be configured to train crews not only for the A3 but for the entire Bradley family of vehicles—the battle command vehicle, the Bradley FIST (fire support team) vehicle, and the Linebacker air defense artillery vehicle. The approach of using tactical software and actual

prototype system parts in the training system will also be used on the Crusader (artillery) and Grizzly (engineer) systems. The SCOE allows the developers to maintain concurrency with the real vehicle, the A3. Using both tactical software and SCOE, BATS becomes a high-fidelity simulator that can be updated at relatively low cost.

Can a training system be developed early enough and be realistic enough to substitute for the actual prototype combat system? With some changes in the acquisition system, using the integrated product team approach and forward thinking on the part of everyone involved—the Infantry Center, the Bradley Fighting Vehicle Manager, and the TRADOC System Manager's offices, and the prime contractor for BATS—the Bradley Program has done just that. It has produced a remarkable simulator, years ahead of schedule and below the projected costs.

The 29th Infantry Regiment at Fort Benning used a BATS training simulator to train the trainers and then train soldiers on the A3. BATS is being developed in phases, each phase being linked to critical milestones in A3 fielding.

In Phase 1, BATS was used to prepare the trainers, testers, and crewmen who participated in the Bradley A3

Limited User Test (LUT) 1 in December 1997.

BATS is a virtual reality simulator, capable of replicating a simulated battlefield environment. A soldier sitting at the commander's or the gunner's station will think he is in an actual A3 turret. The commander's hand station, data entry tool, system control, sight control panel, tactical display, and commander's independent viewer are configured like those in the actual A3.

In many cases, BATS components are actual items from the Bradley A3 production line. The turret is a spatially correct fiberglass molded enclosure that is virtually identical to the actual item. Even the seats are A3 items. Vision blocks, two for the gunner and six for the commander, provide normal out-the-window views that are provided by an image generator to flat-panel displays having the same field of view as the real vehicle. The improved Bradley acquisition system, shared by the gunner and the commander, contain all the reticles, stadia lines, and symbols. Targets appear in the sights in the proper size, magnification, function, and range.

The driver's station is identical to the commander's and gunner's stations. Most equipment is actual A3 production-line hardware items. This station contains an actual gear selector, hand

brake, steering and pedals, fuel and throttle, compass display, driver's viewer enhancement (DVE), and vision blocks. Even the instrument panel contains parts from the A3. The driver's station, which was designed and developed but not required for the LUT 1, will be integrated into BATS later. As the driver operates his throttle, pedals, and steering, the vehicle sounds are heard and the vehicle moves—or seems to move—because of the changing landscape that appears in the vision blocks and DVE.

The dismount infantry squad compartment, like the driver's station, was not required for LUT 1. Nevertheless, its development is planned and work is under way. It features a spatially correct compartment that includes benches, troop hatch, vision blocks depicting the terrain over which the vehicle is fighting, and a squad leader's flat panel display. The integration of Land Warrior will follow.

Another outstanding feature of BATS is the instructor operator station (IOS), which provides a dedicated instructor/crew interaction station co-located with the simulator. A monitoring station also provides pre-briefs and after-action reviews for multiple crews. During Phase 1, in support of LUT 1, the IOS was able to initialize the system, start an exercise, and perform basic monitoring functions, including freez-

ing and unfreezing action. In subsequent phases, additional control and analysis capabilities are planned for the station. The IOS will be able to provide environmental effects such as smoke, fog, and other obscuration. Finally, it will be capable of maintaining total control of any scenario, including the insertion of faults and malfunctions. The BATS internal computer will provide full crew performance scoring as well as student record management.

The mechanical sounds of a Bradley, weapons firing, and the chaotic noise of battle are all part of the scenarios that BATS users will experience. The software includes tracers, detonation, fire resulting from projectile impacts, smoke and changing light conditions corresponding to the time of day.

In Phase 2, BATS—with ever-increasing capabilities including dramatically improved software—will be shipped to Fort Hood to support LUT 2 in May 1998. Again in April-June 1999 at Fort Hood, BATS will support the all-important Initial Operational Test and Evaluation of the A3, which is Phase 3 of BATS development. In each phase, BATS will continue to expand its capabilities as a multi-role trainer until it is scheduled for fielding concurrently with the Bradley A3. The first-unit-equipped date is planned for the period August-November 2000.

The BATS approach, from its incep-

tion, was to maximize the use of hardware and software from commercial off-the-shelf sources and Government programs. Of particular note is the fact that the BATS architecture accommodates operational hardware and software "drops" from the BFV A3 program as they become available. This simply means that BATS will use actual hardware and software created for the A3 instead of inventing hardware and software to look like the combat system. This approach has some recognizable advantages. The real-time transfer of hardware and software from the A3 program achieves substantial cost, technical, and schedule benefits—a result that could be achieved no other way.

In summary, BATS was delivered at a crucial juncture before LUT 1 began. It was a team effort between the Government and the contractors to place a training system in the hands of the users and testers at a critical time to exploit its utility and growth potential. The result will be an outstanding system, developed concurrently with the Infantry Center's oversight and interaction.

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